PAT NO: RE 31,380 [IMAGE AVAILABLE] L15: 21 of 43

SUMMARY:

BSUM(13)

Another . . . viscose solution containing the starch may be spun into filament form, in the manner conventionally used for making chemically crimped **rayon fiber**, by extruding it through fine orifices into a sulfuric acid spin bath, and then **stretching** the filaments, while still plastic, under such conditions as to form coagulated regenerated filaments having a skin and a partly. . .

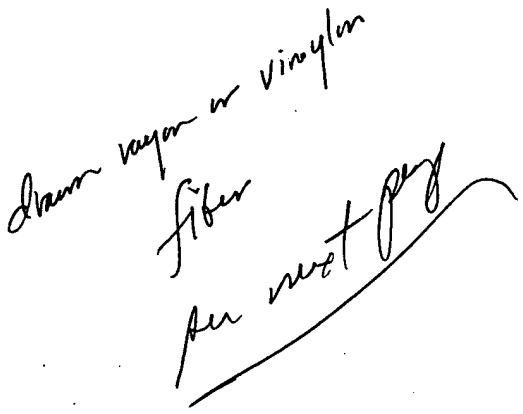
CLAIMS:

CLMS(1)

What . . .

starch-containing regenerated cellulose fibers, said starch having an

amylopectin content of at least 60 percent..]. 14. Process for producing **rayon fibers** which comprises extruding a viscose solution, containing about 5 to 25% dissolved starch b.o.c., to form a plastic **stretchable** fiber and then stretching said plastic fiber at 1



```
   (FILE 'USPAT' ENTERED AT 18:08:17 ON 03 JUN 1998)
L1           265 S TETRON
L2            34 S TETRON (2A) (FIBER OR FIBRE)
L3          2374 S MELT-BLOW#### OR MELTBLOW####
L4             0 S L2 (2P) L3
L5             0 S L3 AND L2]
L6             0 S L2 AND L3
L7             5 S THERMOPLASTIC# (P) L2
L8         14528 S RAYON
L9        232973 S FIBER# OR FIBRE#
L10         4463 S L8 (2A) L9
L11          178 S L3 (2P) L10
L12           82 S L10 (P) L3
L13       368088 S DRAWN OR STRETCH####
L14            0 S L2 (20A) L13
L15           43 S L10 (20A) L13
L16          867 S VINYLON
L17          327 S L16 (2A) L9
L18            0 S L3 (10A) L17
L19            0 S L17 (P) L3
L20         1953 S MICROFIBER OR MICRO-FIBER OR MICROFIBRE OR MICRO-FIBRE
L21            9 S L8 (3A) L20
L22            1 S L16 (3A) L20
L23            0 S L1 (3A) L20

=> d l21 1 2 7 kwic
```

US PAT NO: 5,728,824 [IMAGE AVAILABLE] L21: 1 of 9

SUMMARY:

BSUM(22)

The . . . cotton, and kapok, etc.), bast fiber (hemp, flax), leaf fiber (Manila hemp) and regenerated cellulose fibers. Semisynthetic and synthetic cellulosic **microfibers**, such as acetate **rayon** can be used.

US PAT NO: 5,651,862 [IMAGE AVAILABLE] L21: 2 of 9

DETDESC:

DETD(3)

Fibers . . . fibers, polyvinyl acetate fibers, synthetic polyolefin wood pulp fibers, and the like; as well as regenerated cellulose fibers such as **rayon** and cellulose acetate **microfibers**. Mixtures of various fiber types are also suitable for use. For example, a mixture of cellulosic fibers and synthetic polymeric. . .

US PAT NO: 5,344,701 [IMAGE AVAILABLE] L21: 7 of 9

DETDESC:

DETD(96)

**Rayon** blown **microfiber** web, such as that used in Micropore.TM. tape, commercially available from Minnesota Mining and Manufacturing

Company; and

=> d l22 kwic

US PAT NO: 4,328,133 [IMAGE AVAILABLE] L22: 1 of 1

SUMMARY:

BSUM(3)

As other means for enhancing the elastic modulus of rubbers than the above described method, it has been well known that **micro-fibers** of nylon, **vinylon**, polyester and the like are incorporated in rubbers. Although the rubbers reinforced with these micro-fibers have a high reinforcing ability,. . .

SUMMARY:

BSUM(16)

In . . . is excellent and the crack growth resistance is noticeably improved as compared with that of rubber compositions reinforced with conventional **micro-fibers** of nylon, **vinylon**, polyester and the like, so that the creep becomes noticeably smaller, and further the rebound resilience is more improved than. . .

08/900,254

(FILE 'USPAT' ENTERED AT 10:33:20 ON 03 JUN 1998)

| | | | |
|---|---|---|---|
| L1 | 1265 | S | PLEAT#### (3A) FILTER# |
| L2 | 63 | S | SPACER# (P) L1 |
| L3 | 0 | S | SPACER AND 5064598/PN |
| L4 | 1529 | S | (156/62.2,205,210,462,472,474)/CCLS |
| L5 | 2840 | S | (264/119,122,175,285,286)/CCLS |
| L6 | 4 | S | L5 AND L1 |
| L7 | 8 | S | L4 AND L1 |

=> d 16 1-4

1. 5,234,751, Aug. 10, 1993, Porous material of polytetrafluoroethylene and process for producing the same; Akira Harada, et al., 442/50; 264/41, **119**, 127, 288.4, 288.8; 428/304.4, 315.5, 315.7, 421, 422 [IMAGE AVAILABLE]

2. 4,772,443, Sep. 20, 1988, Thermally formed filter; Donald I. Thornton, et al., **264/119**, 121, DIG.48 [IMAGE AVAILABLE]

3. 4,579,698, Apr. 1, 1986, Process for producing a microporous polymeric filter membrane with adjacent non-porous edge layers and a **pleated filter** element formed from the membrane; Mark T. Meyering, et al., 264/41; 210/493.2; 264/45.1, 45.8, **285**, **286**, 322, DIG.48 [IMAGE AVAILABLE]

4. 3,826,067, Jul. 30, 1974, FILTER; Harry D. Wilder, et al., 55/524,

d cit kwic 21 25 28 12

21. 5,062,874, Nov. 5, 1991, Filter sealing apparatus; Pierre Legare, et al., 55/337, 456, 502; 96/134; 239/524; 277/316, 650, 918 [IMAGE AVAILABLE]

US PAT NO: 5,062,874 [IMAGE AVAILABLE] L2: 21 of 63

DETDESC:

DETD(13)

During the canister's assembly process, the sealant deflector 25 is dropped into place inside the top 12. The **pleated** paper particulate **filter** 30 is then inserted inside the top 12 so that the sealant deflector 25 is sandwiched between the top 12. . . the particulate filter element 30. The top 12 is then mated to the bottom 14. The arms 60 and the **spacers** 68 (if any) cause the substrate 54 and vane assembly 50 to be approximately centered with respect to the inlet. . .

25. 4,853,005, Aug. 1, 1989, Electrically stimulated filter method and apparatus; Rajan A. Jaisinghani, et al., 96/60, 67 [IMAGE AVAILABLE]

US PAT NO: 4,853,005 [IMAGE AVAILABLE] L2: 25 of 63

DETDESC:

DETD(5)

The **pleated** or convoluted **filter** medium 26 utilizes insulative plastic comb-like **spacer** members to maintain the pleat spacing and also to maintain an air gap between the filter medium 26 and each of the electrodes 27 and 28. More specifically, each **spacer** member includes a base portion 29 from which a multiplicity of teeth 30 project in parallel spaced relation. The base. . . no meaningful interference with air flow through the plate is produced. The teeth 30 project into respective troughs of the **pleated filter** medium 26 to thereby maintain the spacing between adjacent pleats. Since the teeth project from both electrodes into the pleats,. . . pleating is maintained integral from both sides of the filter medium. More importantly, a key function provided by the insulative **spacers** 29, 30, is the provision of air gaps 31 and 32. Air gap 31 is disposed between the grounded perforated. . .

DETDESC:

DETD(8)

The . . . the filter medium and the electrode). This spacing is maintained, in the preferred embodiment, by the comb-like structure of the **spacers** including base 29 and the tapered teeth 30. More particularly, the teeth 30 are closer together at their root ends than at their tip ends so that the **pleats** of the **filter** medium 26 can be inserted only to a limited depth between the teeth 30. This, plus the depth of the. . .

CLAIMS:

CLMS(21)

21. . . . peaks, edge portions of said sheet-like member being fixedly secured to said portions of said filter housing;
wherein said first **spacer**, member comprises a first plurality of electrically insulative comb-like members having a base portion secured to said first electrode means. . . base member and into respective troughs of said filter means to maintain said pleats in an open state;
wherein said second **spacer** member comprises a second plurality of electrically insulative comb-like members having a base portion secured to said second electrode means. . . in said filter means to maintain the pleats in an open state; and
wherein the teeth of said first and second **spacer** members are tapered from root ends thereof to tip ends thereof whereby the **pleats** of said **filter** means can be inserted only to a limited depth between the teeth of said first and second **spacer** members, for establishing the length of said first and second air gaps.

28. 4,795,481, Jan. 3, 1989, Air filter with high dust-holding capacity; Jerry R. Ellis, 55/500, 521 [IMAGE AVAILABLE]

US PAT NO: 4,795,481 [IMAGE AVAILABLE] L2: 28 of 63

ABSTRACT:
An air **filter** of the accordion-**pleated** type with successive media pleats providing substantially parallel walls held in spaced relation by corrugated spaces and sealed within a square or rectangular frame. The **spacers** which separate the media in the upstream direction are of higher amplitude than the **spacers** separating the media walls on the downstream side. The upstream **spacers** are preferably about 2 to 21/2 times greater in amplitude than the downstream **spacers**. The filters are particularly advantageous in applications where the loading or dust collection rate is accelerated and the final pressure. . .

SUMMARY:

BSUM(2)

The . . . in zig-zag or accordion fashion to provide a succession of substantially parallel media walls held in spaced relation by corrugaed **spacers**. More specifically, the invention relates to a **pleated** media air **filter** mounted in a square or rectangular frame for use in high dust loading applications.

DETDESC:

DETD(9)

This, . . . to 21/2:1. An example of dimensions for a successfully constructed and tested filter pack having these attributes is: large amplitude **spacers** 0.180"; wide pleat knuckles formed using 0.190" wide pleating bar; narrow amplitude **spacers** 0.080:"; narrow pleat knuckles formed using 0.060" wide **pleating** bar; **filter** pack 221/2" high, 221/2" wide, 101/2" deep.

```
     (FILE 'USPAT' ENTERED AT 10:33:20 ON 03 JUN 1998)
L1          1265 S PLEAT#### (3A) FILTER#
L2            63 S SPACER# (P) L1
L3             0 S SPACER AND 5064598/PN
L4          1529 S (156/62.2,205,210,462,472,474)/CCLS
L5          2840 S (264/119,122,175,285,286)/CCLS
L6             4 S L5 AND L1
L7             8 S L4 AND L1

=> d 1-4
```

1. 5,620,545, Apr. 15, 1997, Method of making a corrugated nonwoven web of polymeric microfiber; David L. Braun, et al., **156/205**, **210** [IMAGE AVAILABLE]

2. 5,472,606, Dec. 5, 1995, Self-supporting, **pleated**, spirally wound **filter**; William C. Steere, et al., 210/489; 55/DIG.5; 156/218, 222, 226, **474**; 210/493.2, 493.4, 500.27, 500.36, 500.41; 264/DIG.48; 493/941 [IMAGE AVAILABLE]

3. 5,376,218, Dec. 27, 1994, Device for manufacturing a filter; Masayuki Mito, et al., **156/474**, 204, 226, 290, 308.4, 499 [IMAGE AVAILABLE]

4. 5,084,178, Jan. 28, 1992, Corrugated filter arrangement with support layer and flow channels; John D. Miller, et al., 210/493.5; 55/521, 524; **156/474**; 210/493.1, 496, 500.26, 500.29 [IMAGE AVAILABLE]

```
=> d 1-8
```

1. 5,620,545, Apr. 15, 1997, Method of making a corrugated nonwoven web of polymeric microfiber; David L. Braun, et al., **156/205**, **210** [IMAGE AVAILABLE]

2. 5,472,606, Dec. 5, 1995, Self-supporting, **pleated**, spirally wound **filter**; William C. Steere, et al., 210/489; 55/DIG.5; 156/218, 222, 226, **474**; 210/493.2, 493.4, 500.27, 500.36, 500.41; 264/DIG.48; 493/941 [IMAGE AVAILABLE]

3. 5,376,218, Dec. 27, 1994, Device for manufacturing a filter; Masayuki Mito, et al., **156/474**, 204, 226, 290, 308.4, 499 [IMAGE AVAILABLE]

4. 5,084,178, Jan. 28, 1992, Corrugated filter arrangement with support layer and flow channels; John D. Miller, et al., 210/493.5; 55/521, 524; **156/474**; 210/493.1, 496, 500.26, 500.29 [IMAGE AVAILABLE]

5. 4,940,500, Jul. 10, 1990, Filter medium forming system and process; Shigeo Tadokoro, et al., 156/204; 55/521; 156/227, **474**; 210/493.2, 493.5; 493/415, 941 [IMAGE AVAILABLE]

6. 4,798,575, Jan. 17, 1989, Method and apparatus for the manufacture of filters; Per-Erik Siversson, 493/346; **156/474**; 493/347, 359, 381, 382, 941 [IMAGE AVAILABLE]

7. 4,594,162, Jun. 10, 1986, **Pleated filter** and method and apparatus for fabricating same; Richard M. Berger, 210/493.1; 55/487, 498, 521, DIG.5; **156/205**, **210**, **474**; 210/493.3, 493.5, 506;

264/287, 507; 425/369; 493/43, 44 [IMAGE AVAILABLE]

8. 4,201,119, May 6, 1980, **Filter pleating** machine; Roger P. Wolf, 493/457; 156/204, **474**; 493/463, 941 [IMAGE AVAILABLE]

```
  (FILE 'USPAT' ENTERED AT 15:35:25 ON 03 JUN 1998)
L1         10330 S UNDRAWN OR UN-DRAWN OR UNSTRETCH## OR (NO#(2A)STRETCH###
#)
L2           681 S (FIBER# OR FIBRE# OR FIBROUS#) (3A) L1
L3          8621 S (DRAWN OR STRETCH###) (3A) (FIBER# OR FIBRE# OR FIBROUS#
)
L4            94 S (BLEND### OR MIX#### OR ADMIX###)(P)L1(P) L2
L5        143449 S WEB OR MAT OR BATT
                 SET HIGH OFF
L6        323076 S FILTER
                 SET HIGH ON
L7            33 S L4 AND L6
L8             8 S (FILTER/AB OR FILTER/TI) AND L4

=> d 2-4 8 cit kwic
```

2. 5,336,556, Aug. 9, 1994, Heat resistant nonwoven fabric and process for producing same; Makoto Yoshida, et al., 442/414; 156/296, 308.2; 428/212, 902 [IMAGE AVAILABLE]

US PAT NO: 5,336,556 [IMAGE AVAILABLE] L8: 2 of 8

ABSTRACT:

A . . . has an excellent heat resistance, formability and concealing effect, and a relatively low density, and is useful as an air **filter** and a covering sheet for heat resistant shaped articles.

SUMMARY:

BSUM(14)

It . . . comprising wholly aromatic polyamide staple fibers is resin-processed with a heat resistant resin, for example, phenol resin or polyimide resin, **mixed** with pigment or carbon particles, or another process in which heat resistant staple **fibers** and **undrawn** **fibers** are interlaced with each other by applying water streams thereto, to form a **mixed** web and then the **mixed** fibers in the web are melt-bonded to each other by a heat-pressing operation, as disclosed in Japanese Unexamined Patent Publication. . .

3. 4,950,529, Aug. 21, 1990, Polyallylene sulfide nonwoven fabric; Masataka Ikeda, et al., 442/400; 428/419 [IMAGE AVAILABLE]

US PAT NO: 4,950,529 [IMAGE AVAILABLE] L8: 3 of 8

ABSTRACT:
A . . . polyallylene sulfide fibers has superior heat resistance, wet heat resistance, resistance to chemicals and fire retardant properties, suitable for various **filter** applications.

SUMMARY:

BSUM(7)

Further . . . punching method. Japanese Unexamined Patent Publication (Kokai) No. 61-289162 disclosed a nonwoven fabric manufactured by heat-fusing a web comprising a **blend** of heat-resistant **fibers** and

**undrawn** PPS **fibers**.

4. 4,883,547, Nov. 28, 1989, Method of forming a high efficiency respirator; Daniel A. Japuntich, 156/73.4, 223, 224, 226, 257, 268, 292 [IMAGE AVAILABLE]

US PAT NO: 4,883,547 [IMAGE AVAILABLE] L8: 4 of 8

ABSTRACT:
The invention provides a filtration face mask which has an expanded filtration surface area and high **filter** efficiency. The mask includes at least two sidewall portions generally extending away from the face of the wearer and away. . .

DETDESC:

DETD(18)

A . . . a basis weight of about 200 g/m.sup.2 which was made on a "Rando Webber" air-laying machine. The web was a **mixture** of 60 weight percent crimped drawn polyethylene terephthalate (PET) staple fibers, 6.5 denier and 5.1 cm (2 inches) in length, and 40 weight percent **undrawn** polyester staple **fiber**, 5.0 denier and 3.8 cm (11/2 inches) in length, which functions as a binder fiber. An approximately 25 cm.times.25 cm. . .

8. 4,259,096, Mar. 31, 1981, Fuel vapor adsorption type air cleaner element for internal combustion engine; Yasuhiko Nakamura, et al., 96/138; 55/486, 498, 510, 524; 156/306.6, 307.5, 325, 331.8 [IMAGE AVAILABLE]

US PAT NO: 4,259,096 [IMAGE AVAILABLE] L8: 8 of 8

ABSTRACT:
An air cleaner element for an internal combustion engine capable of adsorbing fuel vapor and having an air cleaning **filter** medium and a fuel vapor adsorption **filter** medium containing activated carbon fibers, the **filter** media being partly bonded together with an adhesive into a unitary construction. Both the **filter** media have a large surface area so that the reduction in size of the air cleaning **filter** medium and the increase in size of an air cleaner case may not be needed. Furthermore the wear and abrasion. . .

DETDESC:

DETD(13)
(4) . . . meltable adhesive 15. Alternatively, the raw materials of the filter medium 13 such as rayon, vinylon and tetron fibers are **mixed** with thermally meltable, thermoplastic **fibers** such as **unstretched** polyester **fibers** and the **mixture** is formed into the filter medium 13. The filter medium 14 is overlaid over the filter medium 13 and pressed. . .

> d his

(FILE 'USPAT' ENTERED AT 16:42:17 ON 03 JUN 1998)

```
L1          7710 S (BINDER OR BONDING) (2A) (FIBER# OR FIBRE# OR FIBROUS)
L2        636226 S MIXTURE OR MIXING OR ADMIX###
L3           650 S L1 (10A) L2
L4         48084 S FILTER/AB OR FILTER/TI
L5            20 S L3 AND L4
L6             1 S CALENDER#### AND L5
L7            21 S CALENDER#### (2P) L3
L8          6027 S (UNDRAWN OR UN-DRAWN OR UNSTRETCH### OR UN-STRETCH###)
L9           540 S L8 (2A) (FIBER OR FIBRE OR FIBROUS)
L10           26 S L2 (15A) L9
L11        31110 S CALENDER#### OR (HOT OR HEATED)(2A)(ROLL##)
L12           13 S L10 AND L11
L13            0 S L4 AND L12
L14            0 S FILTER AND L13
```

=> del l14

DELETE L14? (Y)/N:y

=> d l12 5 6 9 cit kwic

5. 4,795,559, Jan. 3, 1989, Semipermeable membrane support; Ietsugu Shinjou, et al., 210/490, 500.27 [IMAGE AVAILABLE]

US PAT NO: 4,795,559 [IMAGE AVAILABLE] L12: 5 of 13

SUMMARY:

BSUM(23)

One . . . is prepared by a conventional paper making process. In the conventional process, a prepared web is passed to a heated **calender** to press and densify the same. However, in the process of the invention, the web is dried under no-pressure at. . . 150.degree. C., and it becomes difficult to bond the web with the low density layer in the subsequent process of **calendering** treatment. Also, the low density layer itself is bonded insufficiently. This causes difficulty in densification and results in an insufficient. . . is not bonded utterly, and the web does not keep its shape. This results in problems during the lamination and **calendering** treatment. Accordingly, it is only with temperatures between 80.degree. to 150.degree. C. that the undrawn fibers properly exhibit moderate viscosity. . . and serve as bonding element. Under these conditions, the treatment brings about strong bonding between the two layers upon subsequent **calendering** and desired densification of the high density layer.

SUMMARY:

BSUM(24)

When . . . that the web is lightly self-bonded. However, it is essential to dry the web under no-pressure. If the usual heated **calender** treatment is applied as in the conventional wet process, the

surface of the web i[redacted]moothed, and the lower melting[redacted]. . .

SUMMARY:

BSUM(25)

When a wet process is utilized, the web may be prepared as is a dry processed non-woven fabric by **calendering** treatment. The wet processed web is laminated directly on the web. However the bonding between the high density layer and. . .

SUMMARY:

BSUM(26)

In . . . a modified cross-section and a fiber denier of 1.5 or less, an aspect ratio of 2 to 7, and conventional **undrawn fibers** or conjugated fibers can be used. For such a **mixture**, the proportion of the fibers with the modified cross-section lies desirably in a range from 30 to 70%, more preferably. . .

SUMMARY:

BSUM(28)

The webs of high density and low density layers formed as described above are laminated, and combined firmly with a heated **calender** to form a semipermeable membrane support. The thermal pressing condition applied during the above-mentioned lamination process is controlled so that. . . effect, a temperature of 150.degree. to 250.degree. C., especially 200.degree. to 230.degree. C., is suitable at a linear pressure of **calendering** of 30 kg/cm. Those of ordinary skill in the art can readily determine the heating conditions and **calendering** pressure (linear pressure) required in each individual case, in order to achieve the desired air permeability rates.

DETDESC:

DETD(3)

50% . . . the transverse direction, was laminated as the low density layer on the sheet. The laminated web was subjected to heated **calender** treatment at a temperature of 215.degree. C. under a linear pressure of 30 kg/cm. A semipermeable membrane support having a. . .

DETDESC:

DETD(6)

A . . . high density layer on the low density layer web, and both layers were then laminated by treatment with a heated **calender**. Thus a semipermeable membrane support having a double layeed structure with an air permeability of 1.98 cc/cm.sup.2 /sec was obtained.. . .

DETDESC:

DETD(8)

On . . . of conventional polyester fibers, having a fiber denier of 1.0 denier and fiber length of 33 mm, and 45% of **undrawn** polyester **fiber** with a fiber denier of 1.0 and fiber length of 38 mm. The **mixture** was blended and dry processed, and was then laminated as the high density layer. The resulting double web was subjected. . .

CLAIMS:

CLMS(9)

9. . . . process with hot air to self-bond lightly, pressing said laminated dry processed web and wet processed web with a heated **calender** at a sufficient temperature for bonding firmly the laminated webs.

6. 4,728,394, Mar. 1, 1988, Semipermeable membrane support and process for preparation thereof; Ietsugu Shinjou, et al., 162/129, 130, 132, 146, 201, 206, 207 [IMAGE AVAILABLE]

US PAT NO: 4,728,394 [IMAGE AVAILABLE] L12: 6 of 13

SUMMARY:

BSUM(23)

One . . . is prepared by a conventional paper making process. In the conventional process, a prepared web is passed to a heated **calender** to press and densify the same. However, in the process of the invention, the web is dried under no-pressure at. . . 150.degree. C., and it becomes difficult to bond the web with the low density layer in the subsequent process of **calendering** treatment. Also, the low density layer itself is bonded insufficiently. This causes difficulty in densification and results in an insufficient. . . is not bonded utterly, and the web does not keep its shape. This results in problems during the lamination and **calendering** treatment. Accordingly, it is only with temperatures between 80.degree. to 150.degree. C. that the undrawn fibers properly exhibit moderate viscosity. . . and serve as bonding element. Under these conditions, the treatment brings about strong bonding between the two layers upon subsequent **calendering** and desired densification of the high density layer.

SUMMARY:

BSUM(24)

When . . . that the web is lightly self-bonded. However, it is essential to dry the web under no-pressure. If the usual heated **calender** treatment is applied as in the conventional wet process, the surface of the web is smoothed, and the lower melting. . .

SUMMARY:

BSUM(25)

When a wet process is utilized, the web may be prepared as is a dry processed non-woven fabric by **calendering** treatment. The wet processed web is laminated directly on the web. However the bonding between the high density layer and. . .

SUMMARY:

BSUM(26)

In . . . a modified cross-section and a fiber denier of 1.5 or less, an aspect ratio of 2 to 7, and conventional **undrawn fibers** or conjugated fibers can be used. For such a **mixture**, the proportion of the fibers with the modified cross-section lies desirably in a range from 30 to 70%, more preferably. . .

SUMMARY:

BSUM(28)

The webs of high density and low density layers formed as described above are laminated, and combined firmly with a heated **calender** to form a semipermeable membrane support. The thermal pressing condition applied during the above-mentioned lamination process is controlled so that. . . effect, a temperature of 150.degree. to 250.degree. C., especially 200.degree. to 230.degree. C., is suitable at a linear pressure of **calendering** of 30 kg/cm. Those of ordinary skill in the art can readily determine the heating conditions and **calendering** pressure (linear pressure) required in each individual case, in order to achieve the desired air permeability rates.

DETDESC:

DETD(2)

50% . . . the transverse direction, was laminated as the low density layer on the sheet. The laminated web was subjected to heated **calender** treatment at a temperature of 215.degree. C under a linear pressure of 30 kg/cm. A semipermeable membrane support having a. . .

DETDESC:

DETD(7)

On . . . of conventional polyester fibers, having a fiber denier of 1.0 denier and fiber length of 33 mm, and 45% of **undrawn** polyester **fiber** with a fiber denier of 1.0 and fiber length of 38 mm. The **mixture** was blended and dry processed, and was then laminated as the high density layer. The resulting double web was subjected. . .

CLAIMS:

CLMS(1)

What . . .

process with hot air to self-bond lightly, pressing said laminated dry processed web and wet processed web with a heated **calender** at a sufficient temperature for bonding firmly the laminated webs.

9. 4,180,611, Dec. 25, 1979, Smooth-surfaced nonwoven fabric; Wolfram Schultheiss, et al., 442/337; 210/500.36, 507; 427/194; 428/332, 340, 402, 903; 442/393 [IMAGE AVAILABLE]

US PAT NO: 4,180,611 [IMAGE AVAILABLE] L12: 9 of 13

ABSTRACT:
A . . . a support mat into which at least one surface thereof, an open-structured, continuous covering layer of fine, thermoplastic particles is **calendered**.

SUMMARY:

BSUM(4)

It . . . dry or wet methods or by the spun mat method, and which have been consolidated in some cases by hot **calendering**. In all nonwovens of this kind, the protrusion of individual fiber ends or loops, however, cannot be prevented entirely. On. . . coarse fibers which can be worked by these methods, the surface of the fabric is still relatively rough, even after **calendering**. On account of this roughness of the underlayer, a membrane of irregular thickness is produced when the underlayer is coated,. . .

SUMMARY:

BSUM(7)

This . . . formed of a nonwoven underlayer into whose surface or surfaces an open-structured, continuous covering layer of fine, thermoplastic particles is **calendered**.

SUMMARY:

BSUM(10)

Another . . . this fine particle size an extremely smooth, mat or glossy surface is obtained on the finished product in the subsequent **calendering**, the nonwoven fabric retaining its porous structure. Even in the micron range, the extremely uniform and smooth structure of the. . .

DETDESC:

DETD(2)

From a **mixture** of 35% of **undrawn** polyester **fibers** with a titer of 6.8 dtex and a length of 12 mm as well as 65% of drawn polyester fibers. . .

DETDESC:

DETD(3)

After . . . nonwoven fabric with a weight per unit area of 90 g/m.sup.2 is obtained which is reinforced by means of heat **calendering**.

DETDESC:

DETD(6)

As . . . highly plane and uniform surface of the covering layer is formed. After the final calendar treatment with the above described **calender** with a speed of 12 m/min and a linear pressure of 50 kg/cm and a temperature of 120.degree. C., the. . .

DETDESC:

DETD(7)

On . . . polypropylene fibers with a titer of 2.8 dtex and a length of 60 mm and it is reinforced in the **calender** of example 1 at a speed of 20 m/min and a linear pressure of 60 kg/cm at a temperature of. . .

DETDESC:

DETD(9)

The thus obtained two-layer materal is then **calendered** as in example 1 at a speed of 12 m/min and a linear pressure of 40 kg/cm and a temperature. . .

CLAIMS:

CLMS(1)

What . . .

support material for [redacted] semipermeable membrane, comprising a support mat having at least one surface into which there has been [redacted] **lendered** an open structured porous covering layer of fine flat fibers having a thickness of less than about 30.times.10.sup.-6 m, the. . .